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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/051,973	01/16/2002	Toru Kitayama	393032030300	1562

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EXAMINER

WARREN, DAVID S

ART UNIT PAPER NUMBER

2837

DATE MAILED: 09/17/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/051,973

Applicant(s)

KITAYAMA ET AL.

Examiner

David S. Warren

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 08 July 2003.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-49 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-49 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____.
- 4) ☐ Interview Summary (PTO-413) Paper No(s). _____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____.

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As for the reasons set forth below, the examiner maintains the rejection of the previous office action (paper no. 3).

DETAILED ACTION

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 27 - 30, 32, 33 35, 36, and 40 are rejected under 35 U.S.C. 102(b) as being anticipated by Miyake (5256832). Miyake discloses the reproduction of automatic performance information (i.e. MIDI sequencer), storing audio waveform data (DMTR), and that these systems are synchronized (col. 3, third paragraph). Since the automatic performance data and the audio data are stored in different locations, it is deemed that these data are stored in "parallel." Miyake determines dividing positions by measuring rise portions of an envelope waveform. Regarding claims 29, 30, 32, and 33, Miyake determines the beat (i.e., dividing position) by both the user tapping an input device (note-on or note-off synchronization data) and automatic beat detection (automatic performance data) (col. 8, lines 43-45). Regarding claim 34, as discussed supra, Miyake determines the beat position by auto performance data, synchronization data, and analyzes the waveform to determine the dividing position (see fig. 3, and col. 8, lines 43-45). Regarding claims 35 and 36, the applicant is referred to Miyake's figure 3.

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Regarding claims 37 and 38, tempo clocks are inherent in all MIDI music systems.

Tempo is a fundamental component of music and without a means to control tempo, the teachings of Miyake would be rendered useless. Furthermore, systems that employ both recorded audio and MIDI data must have the ability to synchronize the two, therefore the synchronization system is also inherent (see col. 1, lines 12 and 13).

Regarding claim 39, Miyake shows the use of a computer (3).

Claims 41 - 48 are rejected under 35 U.S.C. 102(b) as being anticipated by Katoh (4794837). Katoh shows the use of dividing a waveform into sections (a PCM section and a DPCM section shown in figure 6). Katoh then adds these sections for form a complete waveform with a continuous envelope. Regarding claims 43 and 48, playing at a faster tempo (i.e., before allowing the portion of the sustain or decay or DPCM to sound), the DPCM section of the Katoh waveform would not be added to the attack portion of the envelope. The applicant is reminded that since note length also determines envelope shape (envelope shape includes sustain and release) that both tempo and note length may be used to determine whether additional stored waveforms are added to the overall envelope. Regarding claims 47 and 48, Katoh shows the use of a storage means to store waveform data (20). Katoh also shows that the added section attenuates from an initial value equal to the envelope level at the end of the previous section (see fig 6). Regarding claims 45 and 46, Katoh shows the use of a code (see elements 6 and 7); the computer is inherent (e.g., code, address generators, memory, registers, etc.). Regarding claim 42, Katoh uses an address signal to match the attenuation rate of the envelope waveform. The applicant also matches the

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envelope but uses a detection format. Since it is crucial to match the envelope waveform between sections (otherwise the musical tone would sound unnatural and unpleasant), the applicant's envelope detecting scheme is deemed to be a design choice. (Note: The examiner believes that the applicant meant to have claim 42 depend from claim 41 and not from claim 1. This appears to be what the applicant intended since claim 42 and 41 have similar preamble and claim 41 provides proper antecedent for all claim 42 elements.) Regarding claim 44, the waveforms stored in Katoh's memory are considered to be the "standard."

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 1 – 26 and 49 are rejected under 35 U.S.C. 103(a) as being unpatentable over Yamada et al. ('687) in view of Miyake ('832). Both Yamada and Miyake disclose detecting beat information from audio waveform data. Miyake discloses an apparatus for detecting a dividing position (Miyake's dividing positions are also considered to be beat positions) and the synchronization of the dividing data with audio output data. Miyake accomplishes this by detection of the envelope (see fig. 3) and the use of a storage device (7) and a processor (3). Figure 3 of Miyake also shows that a range

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within the "rise" portion of the envelope is used to determine beat and dividing positions. Miyake also discloses recording the audio into the storage means (col. 2, line 53), hence the step of "read out the original waveform data" is inherent (e.g. applicant's claims 10 and 12). Miyake does not teach the use of filtering the audio signal prior to detecting a dividing (or beat) position. Yamada discloses the use of a filter (2) to obtain peak values of the audio input waveform without spurious results. Nor does Miyake teach the use of differentiation of the envelope waveform to determine dividing positions (regarding applicant's claims 4 and 12). However, Miyake does teach the use of threshold values in the "rise" (i.e., attack) portion of the waveform envelope. These methods (i.e., detecting a threshold value or differentiating the rise portion of the envelope) are considered functionally equivalent. It would have been obvious to one of ordinary skill in the art to add a filter to the input of Miyake to obtain a beat position (or dividing position) determining method and apparatus. The motivation for this combination is in the Yamada teachings that use the filter to remove high frequencies that may complicate the detection of each beat. Regarding claim 2, since the tempo of Miyake is modified, the beat positions are compressed (increase in tempo) or expanded (decrease in tempo). Regarding claim 4, Yamada "converts" the envelope amplitude via a peak holding circuit (3), i.e., the peak holding circuit will reduce *all* level differences. Regarding claim 5, Yamada uses peak detectors to establish beat (or dividing) positions (3). The delay limitation of applicant's claims 6 and 7 are functionally equivalent to that of the Miyake reference since synchronization is necessary at any chosen tempo, i.e., the two pieces of music must begin at the same time, while keeping beats in

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synchronization. Regarding claims 14, 15, 19, and 20, Miyake shows the use of a threshold level, above and/or below this level is considered a chosen range and since this is a "beat detector" this chosen range will occur at each beat, i.e., regular intervals and in accordance with rhythm tempo. Regarding claims 16 and 21, Miyake shows the use of two thresholds (fig. 3); one for determining the trigger amplitude and one for calculating attack offset. Regarding claims 8, 9, 23, and 24, Miyake shows the use of a computer (3); the use of a computer program code is inherent. Regarding claim 49, both the Yamada and Miyake reference disclose detecting beats from any musical instrument, this includes both percussion instruments and those that perform sustained notes.

Response to Arguments

Applicant's arguments filed July 8, 2003, have been fully considered but they are not persuasive.

Regarding independent claims 27 and 40: The applicant argues that Miyake makes "no mention of synchronization control data." The applicant also asserts that "Miyake does not contain any disclosure of storing a series of synchronization control data indicative of a timing relationship between an automatic performance and a pre-stored waveform data." However, the MIDI clock data of Miyake is "synchronization control data." The purpose of the MIDI clock is to synchronize segments of music

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(especially since the MIDI clock data is generated from the beat data – see Miyake's abstract).

Regarding independent claims 41, 47, and 48: The applicant argues that Katoh does not divide "an original waveform data into a plurality of partial waveform data, and adding attenuating additional sections to the tail end of each of the partial wave form data." Katoh discloses coding each partial segment of a waveform using different coding schema. The examiner interprets this as "dividing." In other words, the waveform is "divided" – or coded – into a PCM section and a DPCM section. Furthermore, the differential PCM coding format is used to the purpose of "adding attenuating additional sections [i.e., the DPCM] to the tail end of each partial waveform data [i.e., the PCM section]."

Regarding independent claim 43: The applicant argues that Katoh does not add sections in accordance with tempo. Katoh discloses that "a waveshape of one period is read out repeatedly by a predetermined period number or time" [emphasis added]. The applicant is reminded that, in music, that time, say the duration of a note, and tempo are direct functions of one another. This relation can be seen in the following equation:

$$t = \frac{60}{T}$$

where T = tempo (in beats per minute); t = duration of quarter note (in seconds); and 60 is the conversion factor (in seconds per minute).

Therefore, Katoh would add and/or remove sections in accordance with the time (i.e., tempo) of a given piece of music.

Regarding independent claims 1 and 10: Miyake discloses designating a type of wavefor from amongst a plurality of waveforms. The Miyake invention detects a beat envelope (col. 9, line 45). This beat envelope is but one type of waveform within the audio output. Other types of waveforms within the Miyake teaching are drum and rhythm tone (col. 8, line 34).

Regarding independent claims 3 and 12: The applicant argues that Yamada does not designate a type of waveform but merely extracts "a waveform of a low-frequency." The examiner maintains that by "*extracting*," Yamada is *designating* a particular type of waveform."

Regarding independent claims 13, 18, 25, and 26: The applicant argues that neither Miyake nor Yamada disclose extracting "one particular rise position as a dividing point of the original waveform data." The beat of any musical performance is "one particular rise portion among many." Otherwise, a listener (or the Miyake invention) would determine beats when any (or every) note was played. The fact that Miyake uses a human tapped input is irrelevant to the applicant's claimed invention and arguments.

Conclusion

THIS ACTION IS MADE FINAL. Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within

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TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to David S. Warren whose telephone number is 703-308-5234. The examiner can normally be reached on M-F, 9:30 A.M. to 6:30 P.M..

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Robert Nappi can be reached on 703-308-3370. The fax phone number for the organization where this application or proceeding is assigned is (703) 872-9306.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-308-0956.

dsw


ROBERT NAPPI
SUPERVISORY PATENT EXAMINER